MV2002L2-0019

WWTF Maintenance Schedule

Equipment	Task	Frequency	Procedure
Actiflo Unit 1 CW - Sensor Turbidity (Low Range)	Inspect, Clean & Verify	**1 Weekly** Inspection, Clean & Verification, Before each calibration and as needed. Depends on sample characteristics	(The following items must be on hand to complete this procedure) -Cleaning solution =25 mL of household bleach in 3.78 liters of water -Tube brush such as Cat. No. 690-00 -Soft brush Verify Dry Verification 1. From the Main Menu, select SENSOR SETUP and confirm; 2. Select CALIBRATE and confirm; 3. Select VERIFICATION and confirm; 4. Select PERFORM VER and confirm. Select the available Output Mode (Active, Hold, or Transfer) from the list box and confirm; 5. Select DRY for the verification type and confirm; 6. Select 1 NTU STD or 20 NTU STD or verify SN of previously used calibration device and confirm; 7. Set the Head to Standard and confirm. Confirm again to accept the reading; 8. The display will read GOOD VER!. Confirm. 9. Enter initials and confirm; 10. Return the sensor to measure mode and confirm; Wet Verification Before starting the verification, read and apply the appropriate tips refer to O&M manual in section 5.6. For wetverification values at or below 1.0 NTU, only use the cleaned turbidimeter body. 1. From the Main Menu, select SENSOR SETUP and confirm; 2. Select CALIBRATE and confirm; 3. Select VERIFICATION and confirm; 4. Select PERFORM TEST and confirm. Select the available Output Mode (Active, Hold, or Transfer) from the list box and confirm; 5. Select WET for the verification type and confirm; 6. Enter the Std Turbidity and confirm. 7. Drain and clean the sensor body and confirm; 8. Pour the standard into cylinder. Replace the head and confirm; 9. The reading will be displayed. Confirm to accept the verification; 10. Return the sensor to measure mode and confirm. Clean (Cleaning: mandatory before calibration, optional before calibration, and mandatory upon verification failure) **Cleaning the Turbidimeter Body** 1. Turn off sample flow to the turbidimeter body; 2. Remove the head assembly and bubble trap cover from the body. Remove the bubble trap by lifting it vertically. Set it aside to be cleaned separately; 3. Drain the body by removing the plug from the bottom of the body. 4. Replace the drain plug and fill the body to the weir with cleaning solution. This cleaning solution can consist of dilute chlorine solution; 5. Use a soft brush to clean the inside surfaces of the body; 6. Remove the drain plug again and thoroughly flush the turbidimeter body with ultra-filtered deionized water; 7. Clean and replace the plug. **Cleaning the Bubble Trap** 1. Prepare a cleaning solution (as in step 4 above) in a container large enough to submerge the entire bubble trap. 2. Using a test tube brush such as Cat. No. 690-00, clean each surface. 3. Rinse the bubble trap thoroughly with ultra-filtered deionized water and reinstall it in the turbidimeter body. 4. Replace the bubble trap cover and head assembly on the top of the body. 5. Restore sample flow to the instrument.
Actiflo Unit 1 CW - Sensor Turbidity (Low Range)	Calibrate	Check and/or perform a calibration periodically (as experience dictates)	(The following items must be on hand to complete this procedure) StablCal 71216-49 Calibration Methods 1. StablCal® (stabilized formazin) – primary or wet calibration of the instrument. Recommended at 20.0 NTU; 2. Formazin – user-prepared primary or wet calibration of the instrument. Recommended at 20.0 NTU; 3. Multi-sensor calibration – Performed with a specialized calibration procedure for up to eight sensors on a single set of fresh StablCal® standards 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Actiflo Unit 1 CW - Sensor Turbidity (Low Range)	Service	Hach recommends replacing the lamp **once a year** to maintain peak performance	Service Replacing the Lamp Assembly The Lamp Assembly is located on the head assembly. Under normal use, Hach recommends replacing the lamp once a year to maintain peak performance. Replacement bulbs have been “burned-in” at the factory and are ready for installation and use Removing a Sensor from the System Prior to physically removing a sensor from the system, record all user defined settings such as relays, signal averaging, etc. Disconnect the sensor connector at the controller. Reinstalling a Sensor on the System (To return the system to normal operation following a software upgrade or sensor repair perform the following procedure) 1. Detach all sensors from the sc100/sc200 controller; 2. From the main menu, press the down arrow key to highlight TEST/MAINT Press ENTER. 3. Use the down arrow key to scroll to SCAN SENSORS and press ENTER; 4. Remove attached sensors by selecting the corresponding serial number or select “All”; 5. Power down the sc100 then attach the 1720E; Note: Clean sensors before reinstallation on the system; 6. Supply power to the sc100. The system will initialize automatically;
Raw Water - Turbidimetre Surface Scatter	Inspect, Clean & Verify	**1 Weekly** Inspection, Clean & Verification of Hach Turbidity Analyzer (SS6sc)	1 - Using hand held analyser test process water and compare to Analyzer reading, Record results. 2 - If the analyser probe is dirty or out of tolerance notify Duty Operator and place Analyzer in hold. 3 - Isolate process stream and remove probe and drain housing. 4 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 5 - If Calibration is required calibrate in a known standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation. 9 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.

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Equipment	Task	Frequency	Procedure
Raw Water - Turbidimetre Surface Scatter	Calibrate	**3 Monthly** Calibration of Hach Turbidity Analyzer (SS6sc)	(The following items must be on hand to complete this procedure) StablCal 71216-49 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Raw Water - Turbidimetre Surface Scatter	Service	**1 Yearly** Service of Hach Turbidity Analyzer (SS6sc)	(The following items must be on hand to complete this procedure) StablCal 71216-49 Lamp Assembly 45034-00 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Ensure Lamp has cooled and replace, refer to O&M manual for instructions. (Ensure Cotton Gloves are worn) 5 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation.
Actiflo Unit 1 CW - Sensor pH Sc	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification of Hach PH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) Hand Held PH Analyzer 1 - Using hand held analyzer test process water and compare to Analyzer reading, Record results. 2 - If the analyzer probe is dirty or out of tolerance notify Duty Operator and place Analyzer in hold. 3 - Isolate process stream and remove probe. 4 - Clean probe and housing using a lint free rag and water. 5 - If Calibration is required you can either calibrate in process water or use a known buffer or standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation. 9 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Actiflo Unit 1 CW - Sensor pH Sc	Calibrate	**1 Weekly** Calibration of Hach PH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) PH Buffer Solution 1 - Notify Duty Operator and place Analyzer in hold; 2 - Isolate process stream and remove probe; 3 - Clean probe and housing using a lint free rag and water. 4 - Calibrate analyzer using O&M manual in process water or use a known buffer or standard. Record calibration details in calibration log; Two Point Manual Calibration 4,1. From the Main Menu, select SENSOR SETUP and confirm. 4,2. Select the appropriate sensor if more than one is attached and confirm. 4,3. Select CALIBRATE and confirm. 4,4. Select 2 POINT MANUAL CAL. Select the available Output Mode (Active, Hold, or Transfer) and confirm. 4,5. Move the clean probe to Solution 1 and confirm. 4,6. Confirm when stable. Edit the solution value and confirm. 4,7. Move probe to solution 1 and confirm. 4,8. Confirm when stable. Edit the solution value and confirm. 4,9. A screen will display 2 Point Manual Cal Complete and the slope (XX.X mV/pH). 4,10. Return the probe to process. 5 - Re assemble probe into housing and return process water to normal flow and let stabilize. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Actiflo Unit 1 CW - Sensor pH Sc	Service	**1 Yearly** Service of Hach PH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) Replacement PH Probe - DPD1P1, 1207434530 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe. 3 - Clean housing using a lint free rag and water. 4 - Disconnect old probe and connect new. 5 - Calibrate analyzer using O&M manual in process water or use a known buffer or standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow and let stabilize. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation.
Clarifier 101 - Clarifier Actiflo CF001	Inspect, Clean & Verify	**1 Yearly** Inspection of Actiflo 1 Clarifier tank	1 - Notify Duty operator and Isolate tank. 2 - Conduct a thorough external inspection of the tank, it's hold down fixings and tank connections. 3 - Drain down tank of it's entire contents then hose out contents and debris. (Refer to O&M for drain down procedure as clarifier tubes could be blocked and collapse under the weight of the sand if drained too quickly) 4 - Conduct an internal inspection. Take note of any damage and coating failures or corrosion. 4 - Record condition of tank, re assemble and de Isolate. 5 - Notify Duty operator when completed.
Clarifier - 101 - Solitax Sc Sensor TSS AIT3-002	Service	**Every 1 year** Service of Hach for seal change	Maintenance Task Duration 1. Visual inspection monthly 2. Check calibration monthly (depending on the ambient conditions) 3. Inspection six months (counter) 4. Seal change every 2 years (counter) 5. Change wiper and reset counter as per counter (20000 cycles)

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Equipment	Task	Frequency	Procedure
Clarier - 101 - Solitax Sc Sensor TSS AIT3-002	Calibrate	Depending on TSS Lab result	Before calibration, determine the behavior of the 4–20 outputs and alarm relays while the user is in the CALIBRATE menu.Ref.**SOLITAX sc User Manual, DOC023.54.032321**. From the Main Menu, select SENSOR SETUP and press confirm. 2. Select the appropriate sensor if more than one is attached and confirm. 3. Select CALIBRATE and press confirm. 4. Select CONFIGURE and confirm. 5. Select the number of points desired for calibration (the unit with linearly interpolate values between calibration points). Select Factor for a single point calibration. 6. Mount the sensor as is during normal operation. Alternatively, place the sensor in the calibration cylinder (or a container with dark, non-reflective walls) 2 inches of clearance from the probe face with the probe face submerged by 1 inch or more. 7. Select SENSOR MEASURE and record the reading. 8. Immediately take a grab sample. Determine the total suspended solids using a gravimetric method such as Method 2540 D in Standards Methods for the Examination of Water and WasteWater. 9. Calculate the new factor. Refer to section 4.6.3.1 for single point (Factor) calibration. Refer section 4.6.3.2 on page 18 for multiple point calibrations. 10. Select FACTOR and press confirm. The corrected measurement should be displayed.
Clarifier 101 - Solitax Sc Sensor TSS AIT3-002	Inspect, Clean & Verify	**1 Weekly** Inspection, Clean & Verification of Hach TSS SOLITAX Sensor (Multiple asset)	1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble Trap and then drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Re assemble probe and Bubble trap into housing and return process water to normal flow. 5 - Ensure analyzer value returns to normal then remove hold. 6 - Notify Duty Operator that the equipment is now in normal operation. 7 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Actiflo Unit 1 - Solitax Sc Sensor TSS AIT3-002	Service	**Every 1 year** Service of Hach for seal change	Maintenance Task Duration 1. Visual inspection monthly 2. Check calibration monthly (depending on the ambient conditions) 3. Inspection six months (counter) 4. Seal change every 2 years (counter) 5. Change wiper and reset counter as per counter (20000 cycles)
Actiflo Unit 2 - Solitax Sc Sensor TSS AIT3-002	Calibrate	Depending on TSS Lab result	Before calibration, determine the behavior of the 4–20 outputs and alarm relays while the user is in the CALIBRATE menu.Ref.**SOLITAX sc User Manual, DOC023.54.032321**. From the Main Menu, select SENSOR SETUP and press confirm. 2. Select the appropriate sensor if more than one is attached and confirm. 3. Select CALIBRATE and press confirm. 4. Select CONFIGURE and confirm. 5. Select the number of points desired for calibration (the unit with linearly interpolate values between calibration points). Select Factor for a single point calibration. 6. Mount the sensor as is during normal operation. Alternatively, place the sensor in the calibration cylinder (or a container with dark, non-reflective walls) 2 inches of clearance from the probe face with the probe face submerged by 1 inch or more. 7. Select SENSOR MEASURE and record the reading. 8. Immediately take a grab sample. Determine the total suspended solids using a gravimetric method such as Method 2540 D in Standards Methods for the Examination of Water and WasteWater. 9. Calculate the new factor. Refer to section 4.6.3.1 for single point (Factor) calibration. Refer section 4.6.3.2 on page 18 for multiple point calibrations. 10. Select FACTOR and press confirm. The corrected measurement should be displayed.
Actiflo Unit 2 - Solitax Sc Sensor TSS AIT3-002	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification of Hach TSS SOLITAX Sensor (Multiple asset)	1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble Trap and then drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Re assemble probe and Bubble trap into housing and return process water to normal flow. 5 - Ensure analyzer value returns to normal then remove hold. 6 - Notify Duty Operator that the equipment is now in normal operation. 7 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Clarifier - 102 - Clarifier Actiflo CF001	Inspect, Clean & Verify	**1 Yearly** Inspection of Actiflo 1 Clarifier tank	1 - Notify Duty operator and Isolate tank. 2 - Conduct a thorough external inspection of the tank, it's hold down fixings and tank connections. 3 - Drain down tank of it's entire contents then hose out contents and debris. (Refer to O&M for drain down procedure as clarifier tubes could be blocked and collapse under the weight of the sand if drained too quickly) 4 - Conduct an internal inspection. Take note of any damage and coating failures or corrosion. 4 - Record condition of tank, re assemble and de Isolate. 5 - Notify Duty operator when completed.
Clarifier - 102 - Solitax Sc Sensor TSS AIT3-002	Service	**Every 1 years** Service of Hach for seal change	Maintenance Task Duration 1. Visual inspection monthly 2. Check calibration monthly (depending on the ambient conditions) 3. Inspection six months (counter) 4. Seal change every 2 years (counter) 5. Change wiper and reset counter as per counter (20000 cycles)
Clarifier - 102 - Solitax Sc Sensor TSS AIT3-002	Calibrate	Depending on TSS Lab result	Before calibration, determine the behavior of the 4–20 outputs and alarm relays while the user is in the CALIBRATE menu.Ref.**SOLITAX sc User Manual, DOC023.54.032321**. From the Main Menu, select SENSOR SETUP and press confirm. 2. Select the appropriate sensor if more than one is attached and confirm. 3. Select CALIBRATE and press confirm. 4. Select CONFIGURE and confirm. 5. Select the number of points desired for calibration (the unit with linearly interpolate values between calibration points). Select Factor for a single point calibration. 6. Mount the sensor as is during normal operation. Alternatively, place the sensor in the calibration cylinder (or a container with dark, non-reflective walls) 2 inches of clearance from the probe face with the probe face submerged by 1 inch or more. 7. Select SENSOR MEASURE and record the reading. 8. Immediately take a grab sample. Determine the total suspended solids using a gravimetric method such as Method 2540 D in Standards Methods for the Examination of Water and WasteWater. 9. Calculate the new factor. Refer to section 4.6.3.1 for single point (Factor) calibration. Refer section 4.6.3.2 on page 18 for multiple point calibrations. 10. Select FACTOR and press confirm. The corrected measurement should be displayed.

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Equipment	Task	Frequency	Procedure
Clarifier - 102 - Solitax Sc Sensor TSS AIT3-002	Inspect, Clean & Verify	**1 Weekly** Inspection, Clean & Verification of Hach TSS SOLITAX Sensor (Multiple asset)	1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble Trap and then drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Re assemble probe and Bubble trap into housing and return process water to normal flow. 5 - Ensure analyzer value returns to normal then remove hold. 6 - Notify Duty Operator that the equipment is now in normal operation. 7 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Clarifier - 101 - Sensor Turbidity (Low Range)	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification, Before each calibration and as needed. Depends on sample characteristics	(The following items must be on hand to complete this procedure) -Cleaning solution =25 mL of household bleach in 3.78 liters of water -Tube brush such as Cat. No. 690-00 -Soft brush Verify Dry Verification 1. From the Main Menu, select SENSOR SETUP and confirm; 2. Select CALIBRATE and confirm; 3. Select VERIFICATION and confirm; 4. Select PERFORM VER and confirm. Select the available Output Mode (Active, Hold, or Transfer) from the list box and confirm; 5. Select DRY for the verification type and confirm; 6. Select 1 NTU STD or 20 NTU STD or verify SN of previously used calibration device and confirm; 7. Set the Head to Standard and confirm. Confirm again to accept the reading; 8. The display will read GOOD VER!. Confirm. 9. Enter initials and confirm; 10. Return the sensor to measure mode and confirm; Wet Verification Before starting the verification, read and apply the appropriate tips refer to O&M manual in section 5.6. For wetverification values at or below 1.0 NTU, only use the cleaned turbidimeter body. 1. From the Main Menu, select SENSOR SETUP and confirm; 2. Select CALIBRATE and confirm; 3. Select VERIFICATION and confirm; 4. Select PERFORM TEST and confirm. Select the available Output Mode (Active, Hold, or Transfer) from the list box and confirm; 5. Select WET for the verification type and confirm; 6. Enter the Std Turbidity and confirm. 7. Drain and clean the sensor body and confirm; 8. Pour the standard into cylinder. Replace the head and confirm; 9. The reading will be displayed. Confirm to accept the verification; 10. Return the sensor to measure mode and confirm. Clean (Cleaning: mandatory before calibration, optional before calibration, and mandatory upon verification failure) **Cleaning the Turbidimeter Body** 1. Turn off sample flow to the turbidimeter body; 2. Remove the head assembly and bubble trap cover from the body. Remove the bubble trap by lifting it vertically. Set it aside to be cleaned separately; 3. Drain the body by removing the plug from the bottom of the body. 4. Replace the drain plug and fill the body to the weir with cleaning solution. This cleaning solution can consist of dilute chlorine solution; 5. Use a soft brush to clean the inside surfaces of the body; 6. Remove the drain plug again and thoroughly flush the turbidimeter body with ultra-filtered deionized water; 7. Clean and replace the plug. **Cleaning the Bubble Trap** 1. Prepare a cleaning solution (as in step 4 above) in a container large enough to submerge the entire bubble trap. 2. Using a test tube brush such as Cat. No. 690-00, clean each surface. 3. Rinse the bubble trap thoroughly with ultra-filtered deionized water and reinstall it in the turbidimeter body. 4. Replace the bubble trap cover and head assembly on the top of the body. 5. Restore sample flow to the instrument.
Clarifier - 101 - Sensor Turbidity (Low Range)	Calibrate	Check and/or perform a calibration periodically (as experience dictates)	(The following items must be on hand to complete this procedure) StablCal 71216-49 Calibration Methods 1. StablCal® (stabilized formazin) – primary or wet calibration of the instrument. Recommended at 20.0 NTU; 2. Formazin – user-prepared primary or wet calibration of the instrument. Recommended at 20.0 NTU; 3. Multi-sensor calibration – Performed with a specialized calibration procedure for up to eight sensors on a single set of fresh StablCal® standards 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Clarifier - 101 - Sensor Turbidity (Low Range)	Service	Hach recommends replacing the lamp once a year to maintain peak performance	Service Replacing the Lamp Assembly The Lamp Assembly is located on the head assembly. Under normal use, Hach recommends replacing the lamp once a year to maintain peak performance. Replacement bulbs have been “burned-in” at the factory and are ready for installation and use Removing a Sensor from the System Prior to physically removing a sensor from the system, record all user defined settings such as relays, signal averaging, etc. Disconnect the sensor connector at the controller. Reinstalling a Sensor on the System (To return the system to normal operation following a software upgrade or sensor repair perform the following procedure) 1. Detach all sensors from the sc100/sc200 controller; 2. From the main menu, press the down arrow key to highlight TEST/MAINT Press ENTER. 3. Use the down arrow key to scroll to SCAN SENSORS and press ENTER; 4. Remove attached sensors by selecting the corresponding serial number or select “All”; 5. Power down the sc100 then attach the 1720E; Note: Clean sensors before reinstallation on the system; 6. Supply power to the sc100. The system will initialize automatically;

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Equipment	Task	Frequency	Procedure
Clarifier - 102 - Sensor Turbidity (Low Range)	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification, Before each calibration and as needed. Depends on sample characteristics	(The following items must be on hand to complete this procedure) -Cleaning solution =25 mL of household bleach in 3.78 liters of water -Tube brush such as Cat. No. 690-00 -Soft brush Verify Dry Verification 1. From the Main Menu, select SENSOR SETUP and confirm; 2. Select CALIBRATE and confirm; 3. Select VERIFICATION and confirm; 4. Select PERFORM VER and confirm. Select the available Output Mode (Active, Hold, or Transfer) from the list box and confirm; 5. Select DRY for the verification type and confirm; 6. Select 1 NTU STD or 20 NTU STD or verify SN of previously used calibration device and confirm; 7. Set the Head to Standard and confirm. Confirm again to accept the reading; 8. The display will read GOOD VER!. Confirm. 9. Enter initials and confirm; 10. Return the sensor to measure mode and confirm; Wet Verification Before starting the verification, read and apply the appropriate tips refer to O&M manual in section 5.6. For wetverification values at or below 1.0 NTU, only use the cleaned turbidimeter body. 1. From the Main Menu, select SENSOR SETUP and confirm; 2. Select CALIBRATE and confirm; 3. Select VERIFICATION and confirm; 4. Select PERFORM TEST and confirm. Select the available Output Mode (Active, Hold, or Transfer) from the list box and confirm; 5. Select WET for the verification type and confirm; 6. Enter the Std Turbidity and confirm. 7. Drain and clean the sensor body and confirm; 8. Pour the standard into cylinder. Replace the head and confirm; 9. The reading will be displayed. Confirm to accept the verification; 10. Return the sensor to measure mode and confirm. Clean (Cleaning: mandatory before calibration, optional before calibration, and mandatory upon verification failure) **Cleaning the Turbidimeter Body** 1. Turn off sample flow to the turbidimeter body; 2. Remove the head assembly and bubble trap cover from the body. Remove the bubble trap by lifting it vertically. Set it aside to be cleaned separately; 3. Drain the body by removing the plug from the bottom of the body. 4. Replace the drain plug and fill the body to the weir with cleaning solution. This cleaning solution can consist of dilute chlorine solution; 5. Use a soft brush to clean the inside surfaces of the body; 6. Remove the drain plug again and thoroughly flush the turbidimeter body with ultra-filtered deionized water; 7. Clean and replace the plug. **Cleaning the Bubble Trap** 1. Prepare a cleaning solution (as in step 4 above) in a container large enough to submerge the entire bubble trap. 2. Using a test tube brush such as Cat. No. 690-00, clean each surface. 3. Rinse the bubble trap thoroughly with ultra-filtered deionized water and reinstall it in the turbidimeter body. 4. Replace the bubble trap cover and head assembly on the top of the body. 5. Restore sample flow to the instrument.
Clarifier - 102 - Sensor Turbidity (Low Range)	Calibrate	Check and/or perform a calibration periodically (as experience dictates)	(The following items must be on hand to complete this procedure) StablCal 71216-49 Calibration Methods 1. StablCal® (stabilized formazin) – primary or wet calibration of the instrument. Recommended at 20.0 NTU; 2. Formazin – user-prepared primary or wet calibration of the instrument. Recommended at 20.0 NTU; 3. Multi-sensor calibration – Performed with a specialized calibration procedure for up to eight sensors on a single set of fresh StablCal® standards 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Clarifier - 102 - Sensor Turbidity (Low Range)	Service	Hach recommends replacing the lamp **once a year** to maintain peak performance	Service Replacing the Lamp Assembly The Lamp Assembly is located on the head assembly. Under normal use, Hach recommends replacing the lamp once a year to maintain peak performance. Replacement bulbs have been “burned-in” at the factory and are ready for installation and use Removing a Sensor from the System Prior to physically removing a sensor from the system, record all user defined settings such as relays, signal averaging, etc. Disconnect the sensor connector at the controller. Reinstalling a Sensor on the System (To return the system to normal operation following a software upgrade or sensor repair perform the following procedure) 1. Detach all sensors from the sc100/sc200 controller; 2. From the main menu, press the down arrow key to highlight TEST/MAINT Press ENTER. 3. Use the down arrow key to scroll to SCAN SENSORS and press ENTER; 4. Remove attached sensors by selecting the corresponding serial number or select “All”; 5. Power down the sc100 then attach the 1720E; Note: Clean sensors before reinstallation on the system; 6. Supply power to the sc100. The system will initialize automatically;
Clarifier - 101 - Turbidimetre Surface Scatter	Inspect, Clean & Verify	**1 Weekly** Inspection, Clean & Verification of Hach Turbidity Analyzer (SS6sc)	1 - Using hand held analyser test process water and compare to Analyzer reading, Record results. 2 - If the analyser probe is dirty or out of tolerance notify Duty Operator and place Analyzer in hold. 3 - Isolate process stream and remove probe and drain housing. 4 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 5 - If Calibration is required calibrate in a known standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation. 9 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.

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Equipment	Task	Frequency	Procedure
Clarifier - 101 - Turbidimetre Surface Scatter	Calibrate	**3 Monthly** Calibration of Hach Turbidity Analyzer (SS6sc)	(The following items must be on hand to complete this procedure) StablCal 71216-49 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Clarifier - 101 - Turbidimetre Surface Scatter	Service	**1 Yearly** Service of Hach Turbidity Analyzer (SS6sc)	(The following items must be on hand to complete this procedure) StablCal 71216-49 Lamp Assembly 45034-00 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Ensure Lamp has cooled and replace, refer to O&M manual for instructions. (Ensure Cotton Gloves are worn) 5 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation.
Clarifier - 102 - Turbidimetre Surface Scatter	Inspect, Clean & Verify	**1 Weekly** Inspection, Clean & Verification of Hach Turbidity Analyzer (SS6sc)	1 - Using hand held analyser test process water and compare to Analyzer reading, Record results. 2 - If the analyser probe is dirty or out of tolerance notify Duty Operator and place Analyzer in hold. 3 - Isolate process stream and remove probe and drain housing. 4 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 5 - If Calibration is required calibrate in a known standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation. 9 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Clarifier - 102 - Turbidimetre Surface Scatter	Calibrate	**3 Monthly** Calibration of Hach Turbidity Analyzer (SS6sc)	(The following items must be on hand to complete this procedure) StablCal 71216-49 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Clarifier - 102 - Turbidimetre Surface Scatter	Service	**1 Yearly** Service of Hach Turbidity Analyzer (SS6sc)	(The following items must be on hand to complete this procedure) StablCal 71216-49 Lamp Assembly 45034-00 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble trap and drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Ensure Lamp has cooled and replace, refer to O&M manual for instructions. (Ensure Cotton Gloves are worn) 5 - Calibrate using StablCal method, refer to O&M manual for instructions. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation.
Post Actiflo CWT - Sensor pHE2-011	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification of Hach PH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) Hand Held PH Analyzer 1 - Using hand held analyzer test process water and compare to Analyzer reading, Record results. 2 - If the analyzer probe is dirty or out of tolerance notify Duty Operator and place Analyzer in hold. 3 - Isolate process stream and remove probe. 4 - Clean probe and housing using a lint free rag and water. 5 - If Calibration is required you can either calibrate in process water or use a known buffer or standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation. 9 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Post Actiflo CWT - Sensor pHE2-011	Calibrate	**1 Weekly** Calibration of Hach pH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) PH Buffer Solution 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe. 3 - Clean probe and housing using a lint free rag and water. 4 - Calibrate analyzer using O&M manual in process water or use a known buffer or standard. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow and let stabilize. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Post Actiflo CWT - Sensor pHE2-011	Service	**1 Yearly** Service of Hach pH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) Replacement PH Probe - For Actiflo's, UF & Neut = 3900VP-02-10 - For RO's 3200HP-02 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe. 3 - Clean housing using a lint free rag and water. 4 - Disconnect old probe and connect new. 5 - Calibrate analyzer using O&M manual in process water or use a known buffer or standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow and let stabilize. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation.

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Equipment	Task	Frequency	Procedure
Clarifier - 101 - Sensor pHE2-011	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification of Hach pH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) Hand Held PH Analyzer 1 - Using hand held analyzer test process water and compare to Analyzer reading, Record results. 2 - If the analyzer probe is dirty or out of tolerance notify Duty Operator and place Analyzer in hold. 3 - Isolate process stream and remove probe. 4 - Clean probe and housing using a lint free rag and water. 5 - If Calibration is required you can either calibrate in process water or use a known buffer or standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation. 9 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Clarifier - 101 - Sensor pHE2-011	Calibrate	**1 Weekly** Calibration of Hach pH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) PH Buffer Solution 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe. 3 - Clean probe and housing using a lint free rag and water. 4 - Calibrate analyzer using O&M manual in process water or use a known buffer or standard. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow and let stabilize. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Clarifier - 101 - Sensor pHE2-011	Service	**1 Yearly** Service of Hach pH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) Replacement PH Probe - For Actiflo's, UF & Neut = 3900VP-02-10 - For RO's 3200HP-02 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe. 3 - Clean housing using a lint free rag and water. 4 - Disconnect old probe and connect new. 5 - Calibrate analyzer using O&M manual in process water or use a known buffer or standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow and let stabilize. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation.
HYDRA-POL-500 / Wetting Cone and Eductor	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification	Refer to the MSDS of the concerned chemicals for proper handling and safe; 1. Inspect the cone for presence of powder accumulation; 2. In case of loss of suction, disassemble and clean the eductor with warm water; 3. Flush eductor with the motive liquid after feeding to remove a possible buildup of solids that could set or harden; 4. Inspect and clean on a daily basis if required;
HYDRA-POL-500 / Static Mixer	Inspect, Clean & Verify	**1 Monthly** Inspection, Clean & Verification	Inspect and clean on a weekly basis if required;
HYDRA-POL-500 / Mixer Mi5P2	Inspect, Clean & Verify	**1 Monthly** Inspection, Clean & Verification	WARNING: DISCONNECT MOTOR LEADS OR USE POWER SUPPLY LOCK-OUT PROCEDURES BEFORE SERVICING, and review safety instructions before starting mixer 1. Check the gearbox if its clean; 2. Check for each regular intervals, the oil level in the gearbox; 3. Change the oil in the gearbox.
HYDRA-POL-500 / Tanks	Inspect, Clean & Verify	**1 Monthly** Inspection	1. At least once a year, completely empty the tank and clean the accumulated deposits and contaminants; 2. Refer to MSDS for chemical suppliers on the proper way of cleaning; 3. Dispose of waste chemicals properly
HYDRA-POL-500 / Chemical Lines	Inspect, Clean & Verify	At least every **six months** or the beginning of an extended outage, a rinsing should be done, preferably with hot water, of the interior lines to remove accumulated deposits and contaminants	1. Dispose of waste chemicals properly; 2. Check for any cracked or damaged equipment and replace them; 3. Check the joints and seals with the pipe regularly; 4. Refer to the manufacturer's manual.
Post Actiflo CWT - Clarified Water Tank T2-011	Inspect, Clean & Verify	**1 Weeky** Inspection, Clean & Verification	1. Protect your equipment by first Turn OFF Treated Water pumps P7-011 and P7-012 on the utility container control panel by putting the selector to OFF; 2. Flush out the CWT opening the drain valve; 3. Then hose down the bottom while sweeping to push away built-up deposits in tank; 4. Repeat once more in afternoon.
Post Actiflo CWT - Solitax Sc Sensor	Service	**Every 1 year** Service of Hach for seal change	Maintenance Task Duration 1. Visual inspection monthly 2. Check calibration monthly (depending on the ambient conditions) 3. Inspection six months (counter) 4. Seal change every 2 years (counter) 5. Change wiper and reset counter as per counter (20000 cycles)

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Equipment	Task	Frequency	Procedure
Post Actiflo CWT - Solitax Sc Sensor	Calibrate	Depending on TSS Lab result	Before calibration, determine the behavior of the 4–20 outputs and alarm relays while the user is in the CALIBRATE menu.Ref.**SOLITAX sc User Manual, DOC023.54.032321**. From the Main Menu, select SENSOR SETUP and press confirm. 2. Select the appropriate sensor if more than one is attached and confirm. 3. Select CALIBRATE and press confirm. 4. Select CONFIGURE and confirm. 5. Select the number of points desired for calibration (the unit with linearly interpolate values between calibration points). Select Factor for a single point calibration. 6. Mount the sensor as is during normal operation. Alternatively, place the sensor in the calibration cylinder (or a container with dark, non-reflective walls) 2 inches of clearance from the probe face with the probe face submerged by 1 inch or more. 7. Select SENSOR MEASURE and record the reading. 8. Immediately take a grab sample. Determine the total suspended solids using a gravimetric method such as Method 2540 D in Standards Methods for the Examination of Water and WasteWater. 9. Calculate the new factor. Refer to section 4.6.3.1 for single point (Factor) calibration. Refer section 4.6.3.2 on page 18 for multiple point calibrations. 10. Select FACTOR and press confirm. The corrected measurement should be displayed.
Post Actiflo CWT - Solitax Sc Sensor	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification of Hach TSS SOLITAX Sensor (Multiple asset)	1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe and bubble Trap and then drain housing using drain plug. 3 - Clean the photo cell window with a cotton swab and use a lint free rag, bottle brush and water for the housing. If algae is present then diluted Hypo can be used on the housing. 4 - Re assemble probe and Bubble trap into housing and return process water to normal flow. 5 - Ensure analyzer value returns to normal then remove hold. 6 - Notify Duty Operator that the equipment is now in normal operation. 7 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Clarifier - 102 - Sensor pHE2-011	Inspect, Clean & Verify	**1 Daily** Inspection, Clean & Verification of Hach PH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) Hand Held PH Analyzer 1 - Using hand held analyzer test process water and compare to Analyzer reading, Record results. 2 - If the analyzer probe is dirty or out of tolerance notify Duty Operator and place Analyzer in hold. 3 - Isolate process stream and remove probe. 4 - Clean probe and housing using a lint free rag and water. 5 - If Calibration is required you can either calibrate in process water or use a known buffer or standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation. 9 - If required, wipe the analyzer and transmitter with a damp cloth to remove dirt and dust particles.
Clarifier - 102 - Sensor pHE2-011	Calibrate	**1 Weekly** Calibration of Hach PH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) PH Buffer Solution 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe. 3 - Clean probe and housing using a lint free rag and water. 4 - Calibrate analyzer using O&M manual in process water or use a known buffer or standard. Record calibration details in calibration log. 5 - Re assemble probe into housing and return process water to normal flow and let stabilize. 6 - Ensure analyzer value returns to normal then remove hold. 7 - Notify Duty Operator that the equipment is now in normal operation.
Clarifier - 102 - Sensor pHE2-011	Service	**1 Yearly** Service of Hach PH Analyzer (Multiple asset)	(The following items must be on hand to complete this procedure) Replacement PH Probe - For Actiflo's, UF & Neut = 3900VP-02-10 - For RO's 3200HP-02 1 - Notify Duty Operator and place Analyzer in hold. 2 - Isolate process stream and remove probe. 3 - Clean housing using a lint free rag and water. 4 - Disconnect old probe and connect new. 5 - Calibrate analyzer using O&M manual in process water or use a known buffer or standard. Record calibration details in calibration log. 6 - Re assemble probe into housing and return process water to normal flow and let stabilize. 7 - Ensure analyzer value returns to normal then remove hold. 8 - Notify Duty Operator that the equipment is now in normal operation.
Polymer - Automatic Sand Filter F7-011	Inspect, Clean & Verify	**3-4 Yearly** of CHEMICAL CLEANING FOR PRESSURE FILTERS TO BE PERFORMED WHEN HEADLOSS EXCEEDS 30 PSI	CHEMICAL CLEANING PROCEDURE FOR PRESSURE FILTERS TO BE PERFORMED WHEN HEADLOSS EXCEEDS 30 PSI 1. Get 2 X 5 L of NaOCl (sodium hypochlorite), 10.3%; 2. Use the Pulsafeeder dosing pump, capacity 30 L/h. Use a 20-L pail with lid. Hook up suction and discharge ½" polyflo hoses to T at inlet of filters. Pour your 2 Javex containers (not dilution) in the pail. Close the lid and pass the suction hose through the opening with small lid. Open valve to T; 3. Start a manual backwash on the first filter. On the utility Container scada, select the page "Service Water", then click on the filter itself, which brings you to the page "FILTERS"; 4. Click on the "AUTO/MANUAL" button, then "START BW". Let the BW run through, it lasts 34 minutes; 5. Plug in your pump. It will say "Fixed rate ?" on the display. Press twice the start button to prime pump. Then press the STOP button when you see that the Javex has made its way to the T; 6. Shut the inlet and outlet manual valves of the filter that you are NOT cleaning; 7. When the BW is over, initiate a second BW by repeating step 3. Go to the filter display, it will post "34 min" and below, "C1", which is the first BW step. The filter will first empty into the SW tank. When the inlet pressure goes up to 70 psi, the filter discharges to drain. Start the dosing pump; 8. Pump Javex until the filter once again discharges into the CWT, it will do that several times during the C1 step. Stop pump when it does that, otherwise you will have Javex going into the SW tank; 9. Stop the feed pump when the filter goes in step C2; 10. Turn OFF Treated Water pumps P7-011 and P7-012 on the utility container control panel by putting the selector to OFF; 11. Shut the inlet and outlet manual valves of the filter that you ARE cleaning. Open the inlet and outlet manual valves of the filter that is NOT in cleaning; 12. Call the mill shifter and let him know to ignore the alarm (SW Pump Fault); 13. Let the BW run through its sequence by watching the display on the filter. When the BW is over, the time of day will be posted; 14. Turn ON the Treated Water pumps P7-011 and P7-012 on the utility container control panel by putting the selector to AUTO; 15. Let the filter soak for 2 hours. Then open the inlet and outlet manual valves of the filter that you ARE cleaning; 16. Start a BW by repeating step 3 above; 17. Repeat for the other filter; 18. Record inlet and outlet pressures to see if your head loss difference between inlet and outlet pressures) is within range (20 to 30 psi);

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Equipment	Task	Frequency	Procedure
Polymer - Automatic Sand Filter F7-012	Inspect, Clean & Verify	**3-4 Yearly** of CHEMICAL CLEANING FOR PRESSURE FILTERS TO BE PERFORMED WHEN HEADLOSS EXCEEDS 30 PSI	CHEMICAL CLEANING PROCEDURE FOR PRESSURE FILTERS TO BE PERFORMED WHEN HEADLOSS EXCEEDS 30 PSI 1. Get 2 X 5 L of NaOCl (sodium hypochlorite), 10.3%; 2. Use the Pulsafeeder dosing pump, capacity 30 L/h. Use a 20-L pail with lid. Hook up suction and discharge ½" polyflo hoses to T at inlet of filters. Pour your 2 Javex containers (not dilution) in the pail. Close the lid and pass the suction hose through the opening with small lid. Open valve to T; 3. Start a manual backwash on the first filter. On the utility Container scada, select the page "Service Water", then click on the filter itself, which brings you to the page "FILTERS"; 4. Click on the "AUTO/MANUAL" button, then "START BW". Let the BW run through, it lasts 34 minutes; 5. Plug in your pump. It will say "Fixed rate ?" on the display. Press twice the start button to prime pump. Then press the STOP button when you see that the Javex has made its way to the T; 6. Shut the inlet and outlet manual valves of the filter that you are NOT cleaning; 7. When the BW is over, initiate a second BW by repeating step 3. Go to the filter display, it will post "34 min" and below, "C1", which is the first BW step. The filter will first empty into the SW tank. When the inlet pressure goes up to 70 psi, the filter discharges to drain. Start the dosing pump; 8. Pump Javex until the filter once again discharges into the CWT, it will do that several times during the C1 step. Stop pump when it does that, otherwise you will have Javex going into the SW tank; 9. Stop the feed pump when the filter goes in step C2; 10. Turn OFF Treated Water pumps P7-011 and P7-012 on the utility container control panel by putting the selector to OFF; 11. Shut the inlet and outlet manual valves of the filter that you ARE cleaning. Open the inlet and outlet manual valves of the filter that is NOT in cleaning; 12. Call the mill shifter and let him know to ignore the alarm (SW Pump Fault); 13. Let the BW run through its sequence by watching the display on the filter. When the BW is over, the time of day will be posted; 14. Turn ON the Treated Water pumps P7-011 and P7-012 on the utility container control panel by putting the selector to AUTO; 15. Let the filter soak for 2 hours. Then open the inlet and outlet manual valves of the filter that you ARE cleaning; 16. Start a BW by repeating step 3 above; 17. Repeat for the other filter; 18. Record inlet and outlet pressures to see if your head loss difference between inlet and outlet pressures) is within range (20 to 30 psi);
Post Actiflo CWT - Air Compressor A08-011	Service	**1 Weekly** Inspection, Clean & Verification The instruction and the scheduled maintenance provided with Quincy Compressor products manual	(The following items must be on hand to complete this procedure) Air filter Lubricant Maintenance Procedure Grid_Checklist in Quincy O&M manual Every 40 Hours (or Weekly) 1-Manually operate the pressure relief valves to be certain they are working; 2-Clean the cooling surfaces of the intercooler, aftercooler and compressor; 3-Check the compressor for air leaks; 4-Check the compressed air distribution system for leaks; 5-Inspect lubricant for contamination & change if necessary; 6-Clean or replace the air intake filter. Check more often under humid or dirty conditions. Every 160 Hours (or Monthly) 1-Check belt tension Every 500 Hours (or Every 3 Months) 1-Change lubricant (more frequently in harsher environments); 2-Torque pulley clamp screws or jamnut.
Post Actiflo CWT Water Booster Pump P7-011 (Sand Filter) Pump	Inspect, Clean & Verify	**1 Weekly** inspection and verification	**A) Preventative pump maintenance** (At regular intervals depending on the conditions and time of operation, the following checks should be made) 1. Pump meets required performance and is operating smoothly and quietly. 2. There are no leaks, particularly at the shaft seal. 3. The motor is not overheating. 4. Remove and clean all strainers or filters in the system. 5. Verify the tripping of the motor overload protection. 6. Check the operation of all controls. Check unit control cycling twice and adjust, if necessary. 7. If the pump is not operated for unusually long periods, the unit should be maintained in accordance with these instructions. In addition, if the pump is not drained, the pump shaft should be manually rotated or run for short periods of time at monthly intervals. 8. To extend the pump life in severe duty applications, consider performing one of the following actions: – Drain the pump after each use. – Flush the pump, through system, with water or other fluid that is compatible with the pump materials and process liquid. – Disassemble the pump liquid components and thoroughly rinse or wash them with water or other fluid that is compatible with the pump materials and process liquid. If the pump fails to operate or there is a loss of performance, refer to Section 15. Diagnosing specific problems.

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Equipment	Task	Frequency	Procedure
Post Actiflo CWT Water Booster Pump P7-012 (Sand Filter) Pump	Service	**2 Yearly** or 500 hours of operation	**Warning** Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation, and maintenance of this equipment. **B) Motor Inspection** Inspect the motor at regular intervals, approximately every 500 hours of operation or every three months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection: 1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper, pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure. 2. Use an Ohmmeter ("Megger") periodically to ensure that the integrity of the winding insulation has been maintained. Record the Ohmmeter readings. Immediately investigate any significant drop in insulation resistance. 3. Check all electrical connectors to be sure that they are tight. 4.Motor Lubrication Electric motors are pre-lubricated at the factory and do not require additional lubrication at start-up. Motors without external grease fittings have sealed bearings that cannot be re-lubricated. Motors with grease fittings should only be lubricated with approved types of grease. Do not over-grease the bearings. Over-greasing will cause increased bearing heat and can result in bearing/motor failure. Do not mix petroleum grease and silicon grease in motor bearings.
Post Actiflo CWT Water Booster Pump P7-012 (Sand Filter) Pump	Inspect, Clean & Verify	**1 Weekly** inspection and verification	**A) Preventative pump maintenance** (At regular intervals depending on the conditions and time of operation, the following checks should be made) 1. Pump meets required performance and is operating smoothly and quietly. 2. There are no leaks, particularly at the shaft seal. 3. The motor is not overheating. 4. Remove and clean all strainers or filters in the system. 5. Verify the tripping of the motor overload protection. 6. Check the operation of all controls. Check unit control cycling twice and adjust, if necessary. 7. If the pump is not operated for unusually long periods, the unit should be maintained in accordance with these instructions. In addition, if the pump is not drained, the pump shaft should be manually rotated or run for short periods of time at monthly intervals. 8. To extend the pump life in severe duty applications, consider performing one of the following actions: – Drain the pump after each use. – Flush the pump, through system, with water or other fluid that is compatible with the pump materials and process liquid. – Disassemble the pump liquid components and thoroughly rinse or wash them with water or other fluid that is compatible with the pump materials and process liquid. If the pump fails to operate or there is a loss of performance, refer to Section 15. Diagnosing specific problems.
Post Actiflo CWT Water Booster Pump P7-012 (Sand Filter) Pump	Service	**2 Yearly** or 500 hours of operation	**Warning** Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation, and maintenance of this equipment. **B) Motor Inspection** Inspect the motor at regular intervals, approximately every 500 hours of operation or every three months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection: 1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper, pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure. 2. Use an Ohmmeter ("Megger") periodically to ensure that the integrity of the winding insulation has been maintained. Record the Ohmmeter readings. Immediately investigate any significant drop in insulation resistance. 3. Check all electrical connectors to be sure that they are tight. 4.Motor Lubrication Electric motors are pre-lubricated at the factory and do not require additional lubrication at start-up. Motors without external grease fittings have sealed bearings that cannot be re-lubricated. Motors with grease fittings should only be lubricated with approved types of grease. Do not over-grease the bearings. Over-greasing will cause increased bearing heat and can result in bearing/motor failure. Do not mix petroleum grease and silicon grease in motor bearings.

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Equipment	Task	Frequency	Procedure
Chemical Container SW - Shower Booster Pump P5-012 A) Pump	Inspect, Clean & Verify	**1 Weekly** inspection and verification	**A) Preventative pump maintenance** (At regular intervals depending on the conditions and time of operation, the following checks should be made) 1. Pump meets required performance and is operating smoothly and quietly. 2. There are no leaks, particularly at the shaft seal. 3. The motor is not overheating. 4. Remove and clean all strainers or filters in the system. 5. Verify the tripping of the motor overload protection. 6. Check the operation of all controls. Check unit control cycling twice and adjust, if necessary. 7. If the pump is not operated for unusually long periods, the unit should be maintained in accordance with these instructions. In addition, if the pump is not drained, the pump shaft should be manually rotated or run for short periods of time at monthly intervals. 8. To extend the pump life in severe duty applications, consider performing one of the following actions: – Drain the pump after each use. – Flush the pump, through system, with water or other fluid that is compatible with the pump materials and process liquid. – Disassemble the pump liquid components and thoroughly rinse or wash them with water or other fluid that is compatible with the pump materials and process liquid. If the pump fails to operate or there is a loss of performance, refer to Section 15. Diagnosing specific problems.
Chemical Container SW - Shower Booster Pump P5-012 B) Motor	Service	**2 Yearly** or 500 hours of operation	**Warning** Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation, and maintenance of this equipment. **B) Motor Inspection** Inspect the motor at regular intervals, approximately every 500 hours of operation or every three months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection: 1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper, pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure. 2. Use an Ohmmeter (“Megger”) periodically to ensure that the integrity of the winding insulation has been maintained. Record the Ohmmeter readings. Immediately investigate any significant drop in insulation resistance. 3. Check all electrical connectors to be sure that they are tight. 4.Motor Lubrication Electric motors are pre-lubricated at the factory and do not require additional lubrication at start-up. Motors without external grease fittings have sealed bearings that cannot be re-lubricated. Motors with grease fittings should only be lubricated with approved types of grease. Do not over-grease the bearings. Over-greasing will cause increased bearing heat and can result in bearing/motor failure. Do not mix petroleum grease and silicon grease in motor bearings.
Chemical Container - Water Booster Pump P7-013 (Hydrapol) A) Pump	Inspect, Clean & Verify	**1 Weekly** inspection and verification	**A) Preventative pump maintenance** (At regular intervals depending on the conditions and time of operation, the following checks should be made) 1. Pump meets required performance and is operating smoothly and quietly. 2. There are no leaks, particularly at the shaft seal. 3. The motor is not overheating. 4. Remove and clean all strainers or filters in the system. 5. Verify the tripping of the motor overload protection. 6. Check the operation of all controls. Check unit control cycling twice and adjust, if necessary. 7. If the pump is not operated for unusually long periods, the unit should be maintained in accordance with these instructions. In addition, if the pump is not drained, the pump shaft should be manually rotated or run for short periods of time at monthly intervals. 8. To extend the pump life in severe duty applications, consider performing one of the following actions: – Drain the pump after each use. – Flush the pump, through system, with water or other fluid that is compatible with the pump materials and process liquid. – Disassemble the pump liquid components and thoroughly rinse or wash them with water or other fluid that is compatible with the pump materials and process liquid. If the pump fails to operate or there is a loss of performance, refer to Section 15. Diagnosing specific problems

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Equipment	Task	Frequency	Procedure
Chemical Container SW - Water Booster Pump P7-013 (Hydrapol) A) Pump	Inspect, Clean & Verify	**1 Weekly** inspection and verification	**A) Preventative pump maintenance** (At regular intervals depending on the conditions and time of operation, the following checks should be made) 1. Pump meets required performance and is operating smoothly and quietly. 2. There are no leaks, particularly at the shaft seal. 3. The motor is not overheating. 4. Remove and clean all strainers or filters in the system. 5. Verify the tripping of the motor overload protection. 6. Check the operation of all controls. Check unit control cycling twice and adjust, if necessary. 7. If the pump is not operated for unusually long periods, the unit should be maintained in accordance with these instructions. In addition, if the pump is not drained, the pump shaft should be manually rotated or run for short periods of time at monthly intervals. 8. To extend the pump life in severe duty applications, consider performing one of the following actions: – Drain the pump after each use. – Flush the pump, through system, with water or other fluid that is compatible with the pump materials and process liquid. – Disassemble the pump liquid components and thoroughly rinse or wash them with water or other fluid that is compatible with the pump materials and process liquid. If the pump fails to operate or there is a loss of performance, refer to Section 15. Diagnosing specific problems.
Chemical Container SW - Water Booster Pump P7-013 (Hydrapol) B) Motor	Service	**2 Yearly** or 500 hours of operation	**Warning** Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation, and maintenance of this equipment. **B) Motor Inspection** Inspect the motor at regular intervals, approximately every 500 hours of operation or every three months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection: 1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper, pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure. 2. Use an Ohmmeter (“Megger”) periodically to ensure that the integrity of the winding insulation has been maintained. Record the Ohmmeter readings. Immediately investigate any significant drop in insulation resistance. 3. Check all electrical connectors to be sure that they are tight. 4.Motor Lubrication Electric motors are pre-lubricated at the factory and do not require additional lubrication at start-up. Motors without external grease fittings have sealed bearings that cannot be re-lubricated. Motors with grease fittings should only be lubricated with approved types of grease. Do not over-grease the bearings. Over-greasing will cause increased bearing heat and can result in bearing/motor failure. Do not mix petroleum grease and silicon grease in motor bearings.
Chemical Container - Water Booster Pump P7-014 (Hydrapol) A) Pump	Inspect, Clean & Verify	**1 Weekly** inspection and verification	**A) Preventative pump maintenance** (At regular intervals depending on the conditions and time of operation, the following checks should be made) 1. Pump meets required performance and is operating smoothly and quietly. 2. There are no leaks, particularly at the shaft seal. 3. The motor is not overheating. 4. Remove and clean all strainers or filters in the system. 5. Verify the tripping of the motor overload protection. 6. Check the operation of all controls. Check unit control cycling twice and adjust, if necessary. 7. If the pump is not operated for unusually long periods, the unit should be maintained in accordance with these instructions. In addition, if the pump is not drained, the pump shaft should be manually rotated or run for short periods of time at monthly intervals. 8. To extend the pump life in severe duty applications, consider performing one of the following actions: – Drain the pump after each use. – Flush the pump, through system, with water or other fluid that is compatible with the pump materials and process liquid. – Disassemble the pump liquid components and thoroughly rinse or wash them with water or other fluid that is compatible with the pump materials and process liquid. If the pump fails to operate or there is a loss of performance, refer to Section 15. Diagnosing specific problems.

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Equipment	Task	Frequency	Procedure
Chemical Container SW - Water Booster Pump P7-014 (Hydrapol) B) Motor	Service	**2 Yearly** or 500 hours of operation	**Warning** Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation, and maintenance of this equipment. **B) Motor Inspection** Inspect the motor at regular intervals, approximately every 500 hours of operation or every three months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection: 1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper, pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure. 2. Use an Ohmmeter ("Megger") periodically to ensure that the integrity of the winding insulation has been maintained. Record the Ohmmeter readings. Immediately investigate any significant drop in insulation resistance. 3. Check all electrical connectors to be sure that they are tight. 4.Motor Lubrication Electric motors are pre-lubricated at the factory and do not require additional lubrication at start-up. Motors without external grease fittings have sealed bearings that cannot be re-lubricated. Motors with grease fittings should only be lubricated with approved types of grease. Do not over-grease the bearings. Over-greasing will cause increased bearing heat and can result in bearing/motor failure. Do not mix petroleum grease and silicon grease in motor bearings.
Post Actiflo CWT - Water Booster Pump P7-011 (Sand Filter) B) Motor	Inspect, Clean & Verify	**1 Weekly** inspection and verification	**A) Preventative pump maintenance** (At regular intervals depending on the conditions and time of operation, the following checks should be made) 1. Pump meets required performance and is operating smoothly and quietly. 2. There are no leaks, particularly at the shaft seal. 3. The motor is not overheating. 4. Remove and clean all strainers or filters in the system. 5. Verify the tripping of the motor overload protection. 6. Check the operation of all controls. Check unit control cycling twice and adjust, if necessary. 7. If the pump is not operated for unusually long periods, the unit should be maintained in accordance with these instructions. In addition, if the pump is not drained, the pump shaft should be manually rotated or run for short periods of time at monthly intervals. 8. To extend the pump life in severe duty applications, consider performing one of the following actions: – Drain the pump after each use. – Flush the pump, through system, with water or other fluid that is compatible with the pump materials and process liquid. – Disassemble the pump liquid components and thoroughly rinse or wash them with water or other fluid that is compatible with the pump materials and process liquid. If the pump fails to operate or there is a loss of performance, refer to Section 15. Diagnosing specific problems.
Post Actiflo CWT - Water Booster Pump P7-011 (Sand Filter) B) Motor	Inspect, Clean & Verify	**2 Yearly** or 500 hours of operation	**Warning** Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation, and maintenance of this equipment. **B) Motor Inspection** Inspect the motor at regular intervals, approximately every 500 hours of operation or every three months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection: 1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper, pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure. 2. Use an Ohmmeter ("Megger") periodically to ensure that the integrity of the winding insulation has been maintained. Record the Ohmmeter readings. Immediately investigate any significant drop in insulation resistance. 3. Check all electrical connectors to be sure that they are tight. 4.Motor Lubrication Electric motors are pre-lubricated at the factory and do not require additional lubrication at start-up. Motors without external grease fittings have sealed bearings that cannot be re-lubricated. Motors with grease fittings should only be lubricated with approved types of grease. Do not over-grease the bearings. Over-greasing will cause increased bearing heat and can result in bearing/motor failure. Do not mix petroleum grease and silicon grease in motor bearings.

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Equipment	Task	Frequency	Procedure
Post Actiflo CWT - Water Booster Pump P7-012 (Sand Filter) A) Pump	Inspect, Clean & Verify	**1 Weekly** inspection and verification(Pump). 4 Y	**A) Preventative pump maintenance** (At regular intervals depending on the conditions and time of operation, the following checks should be made) 1. Pump meets required performance and is operating smoothly and quietly. 2. There are no leaks, particularly at the shaft seal. 3. The motor is not overheating. 4. Remove and clean all strainers or filters in the system. 5. Verify the tripping of the motor overload protection. 6. Check the operation of all controls. Check unit control cycling twice and adjust, if necessary. 7. If the pump is not operated for unusually long periods, the unit should be maintained in accordance with these instructions. In addition, if the pump is not drained, the pump shaft should be manually rotated or run for short periods of time at monthly intervals. 8. To extend the pump life in severe duty applications, consider performing one of the following actions: – Drain the pump after each use. – Flush the pump, through system, with water or other fluid that is compatible with the pump materials and process liquid. – Disassemble the pump liquid components and thoroughly rinse or wash them with water or other fluid that is compatible with the pump materials and process liquid. If the pump fails to operate or there is a loss of performance, refer to Section 15. Diagnosing specific problems.
Post Actiflo CWT - Water Booster Pump P7-012 (Sand Filter) B) Motor	Inspect, Clean & Verify	**2 Yearly** or 500 hours of operation	Warning Do not touch electrical connections before you first ensure that power has been disconnected. Electrical shock can cause serious or fatal injury. Only qualified personnel should attempt installation, operation, and maintenance of this equipment. **B) Motor Inspection** Inspect the motor at regular intervals, approximately every 500 hours of operation or every three months, whichever occurs first. Keep the motor clean and the ventilation openings clear. The following steps should be performed at each inspection: 1. Check that the motor is clean. Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. Oily vapor, paper, pulp, textile lint, etc. can accumulate and block motor ventilation. If the motor is not properly ventilated, overheating can occur and cause early motor failure. 2. Use an Ohmmeter (“Megger”) periodically to ensure that the integrity of the winding insulation has been maintained. Record the Ohmmeter readings. Immediately investigate any significant drop in insulation resistance. 3. Check all electrical connectors to be sure that they are tight. 4.Motor Lubrication Electric motors are pre-lubricated at the factory and do not require additional lubrication at start-up. Motors without external grease fittings have sealed bearings that cannot be re-lubricated. Motors with grease fittings should only be lubricated with approved types of grease. Do not over-grease the bearings. Over-greasing will cause increased bearing heat and can result in bearing/motor failure. Do not mix petroleum grease and silicon grease in motor bearings.
Chemical Container - Coagulant Transfert Pump P9-511	Inspect, Clean & Verify	**1 Yearly**(TBA by YAMADA), depending Guideline of diaphragm life CR, NBR, EPDM 10,000,000 cycle FKM 2,500,000 cycle PTFE 3,000,000 cycle TPEE, TPO 15,000,000 cycle	(The following items may need to be on hand to complete maintenance procedure. When it is instructed that special tools must be used, be sure to use the specified tools. Otherwise, the pump may be damaged)1. General tools Socket wrenches 10mm, 12mm, 13mm, 17mm, 22mm Hexagonal box wrenches 5mm Open-end wrenches 13mm (BP_, BV_), 22mm (BA_, BS_, BF_) 2. Special tools Accessory tool (included) •Sleeve remover (sold separately) Purpose: Removing the center disk Purpose: For removing sleeves of BP and BV_ types 1-When replacing parts, be sure to use the recommended genuine parts or equivalents. Use of other parts may cause a malfunction of the product; 2-Before starting maintenance work, cut off the feed air and clean the pump. If air pressure or residue remain in the pump, there is danger of explosion, or possible poisoning resulting in serious injury or death if chemicals adhere to the skin or are accidentally swallowed; Inspect 1-Ball; Measure the outside diameter, and if it is outside the usable range, replace the ball; Usable range of Ball NDP-20BPS-PP-FLGS ø0.957 ~ Sø1.095 in {Sø24.3 ~ Sø27.8 mm} 2-Valve seat; Measure the dimension shown in O&M (Fig.4.10) and if it is outside the usable range, replace the valve seat; Usable range of Valve seat 0.130 ~ 0.319 in {3.3 ~ 8.1 mm} 3- O ring (other than PTFE) If O ring is worn out or cracked, replace it Verify 1-Diaphragm If the diaphragm is worn out or damaged, replace it 2- Centre rod Measure the diameter, and if it is outside the usable range, replace the centre rod. Usable range of centre rod ø 17,9 ~ ø 18,0 mm Clean 1-For details on cleaning the pump, refer to Chapter 6 of the operating manual;

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Equipment	Task	Frequency	Procedure
Chemical Container - Coagulant Transfert Pump P9-512	Inspect, Clean & Verify	**1 Yearly**(TBA by Yamada), depending Guideline of diaphragm life CR, NBR, EPDM 10,000,000 cycle FKM 2,500,000 cycle PTFE 3,000,000 cycle TPEE, TPO 15,000,000 cycle	(The following items may need to be on hand to complete maintenance procedure. When it is instructed that special tools must be used, be sure to use the specified tools. Otherwise, the pump may be damaged) 1. General tools Socket wrenches 10mm, 12mm, 13mm, 17mm, 22mm Hexagonal box wrenches 5mm Open-end wrenches 13mm (BP_, BV_), 22mm (BA_, BS_, BF_) 2. Special tools Accessory tool (included) •Sleeve remover (sold separately) Purpose: Removing the center disk Purpose: For removing sleeves of BP and BV_ types 1-When replacing parts, be sure to use the recommended genuine parts or equivalents. Use of other parts may cause a malfunction of the product; 2-Before starting maintenance work, cut off the feed air and clean the pump. If air pressure or residue remain in the pump, there is danger of explosion, or possible poisoning resulting in serious injury or death if chemicals adhere to the skin or are accidentally swallowed; Inspect 1-Ball; Measure the outside diameter, and if it is outside the usable range, replace the ball; Usable range of Ball NDP-20BPS-PP-FLGS ø0.957 ~ Sø1.095 in {Sø24.3 ~ Sø27.8 mm} 2-Valve seat; Measure the dimension shown in O&M (Fig.4.10) and if it is outside the usable range, replace the valve seat; Usable range of Valve seat 0.130 ~ 0.319 in {3.3 ~ 8.1 mm} 3- O ring (other than PTFE) If O ring is worn out or cracked, replace it Verify 1-Diaphragm If the diaphragm is worn out or damaged, replace it 2- Centre rod Measure the diameter, and if it is outside the usable range, replace the centre rod. Usable range of centre rod ø 17,9 ~ ø 18,0 mm Clean 1-For details on cleaning the pump, refer to Chapter 6 of the operating manual; W:\2012\5000612023 - NATC CONTAINERS\11) Services Techniques\09) Ingenierie Execution\3- Fiches Techniques\YAMADA
Chemical Container - Polymer Transfert Pump P9-521	Inspect, Clean & Verify	**1 Yearly**(TBA by YAMADA), depending Guideline of diaphragm life CR, NBR, EPDM 10,000,000 cycle FKM 2,500,000 cycle PTFE 3,000,000 cycle TPEE, TPO 15,000,000 cycle	(The following items may need to be on hand to complete maintenance procedure. When it is instructed that special tools must be used, be sure to use the specified tools. Otherwise, the pump may be damaged) 1. General tools Socket wrenches 10mm, 12mm, 13mm, 17mm, 22mm Hexagonal box wrenches 5mm Open-end wrenches 13mm (BP_, BV_), 22mm (BA_, BS_, BF_) 2. Special tools Accessory tool (included) •Sleeve remover (sold separately) Purpose: Removing the center disk Purpose: For removing sleeves of BP and BV_ types 1-When replacing parts, be sure to use the recommended genuine parts or equivalents. Use of other parts may cause a malfunction of the product; 2-Before starting maintenance work, cut off the feed air and clean the pump. If air pressure or residue remain in the pump, there is danger of explosion, or possible poisoning resulting in serious injury or death if chemicals adhere to the skin or are accidentally swallowed; Inspect 1-Ball; Measure the outside diameter, and if it is outside the usable range, replace the ball; Usable range of Ball ø0.957 ~ Sø1.095 in {Sø24.3 ~ Sø27.8 mm} for model NDP-20BPS-PP 2-Valve seat; Measure the dimension shown in O&M (Fig.4.10) and if it is outside the usable range, replace the valve seat; Usable range of Valve seat 0.130 ~ 0.319 in {3.3 ~ 8.1 mm} 3- O ring (other than PTFE) If O ring is worn out or cracked, replace it Verify 1-Diaphragm If the diaphragm is worn out or damaged, replace it 2- Centre rod Measure the diameter, and if it is outside the usable range, replace the centre rod. Usable range of centre rod ø 17,9 ~ ø 18,0 mm Clean 1-For details on cleaning the pump, refer to Chapter 6 of the operating manual;

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Equipment	Task	Frequency	Procedure
Chemical Container - Polymer Transfert Pump P9-522	Inspect, Clean & Verify	**1 Yearly**(TBA by Yamada), depending Guideline of diaphragm life CR, NBR, EPDM 10,000,000 cycle FKM 2,500,000 cycle PTFE 3,000,000 cycle TPEE, TPO 15,000,000 cycle	(The following items may need to be on hand to complete maintenance procedure. When it is instructed that special tools must be used, be sure to use the specified tools. Otherwise, the pump may be damaged) 1. General tools Socket wrenches 10mm, 12mm, 13mm, 17mm, 22mm Hexagonal box wrenches 5mm Open-end wrenches 13mm (BP_, BV_), 22mm (BA_, BS_, BF_) 2. Special tools Accessory tool (included) •Sleeve remover (sold separately) Purpose: Removing the center disk Purpose: For removing sleeves of BP and BV_ types 1-When replacing parts, be sure to use the recommended genuine parts or equivalents. Use of other parts may cause a malfunction of the product; 2-Before starting maintenance work, cut off the feed air and clean the pump. If air pressure or residue remain in the pump, there is danger of explosion, or possible poisoning resulting in serious injury or death if chemicals adhere to the skin or are accidentally swallowed; Inspect 1-Ball; Measure the outside diameter, and if it is outside the usable range, replace the ball; Usable range of Ball ø0.957 ~ Sø1.095 in {Sø24.3 ~ Sø27.8 mm} for model NDP-20BPS-PP 2-Valve seat; Measure the dimension shown in O&M (Fig.4.10) and if it is outside the usable range, replace the valve seat; Usable range of Valve seat 0.130 ~ 0.319 in {3.3 ~ 8.1 mm} 3- O ring (other than PTFE) If O ring is worn out or cracked, replace it Verify 1-Diaphragm If the diaphragm is worn out or damaged, replace it 2- Centre rod Measure the diameter, and if it is outside the usable range, replace the centre rod. Usable range of centre rod ø 17,9 ~ ø 18,0 mm Clean 1-For details on cleaning the pump, refer to Chapter 6 of the operating manual; W:\2012\5000612023 - NATC CONTAINERS\11) Services Techniques\09) Ingenierie Execution\3- Fiches Techniques\YAMADA
Clarifier - 101 - Pump Centrifugal P2-011	Service	**2 Weekly** Service of McLanahan Slurry Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Grease gun with either Shell Alvania 3, Mobile EP2, Caltex LS3 or their equivalents. 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Lubricate Bearings while pump is running for best distribution. (Do not over grease as this will cause premature bearing failure) 3 - Inspect gland seal and check flush water is clean and the flow is sufficient (If applicable) 4 - Isolate Pump and check belt tension, 16mm belt deflection over 1 meter is ideal and check pulley alignment. 5 - Inspect all hold down bolts are secure and report any leaks or corrosion.
Actiflo Unit 2 - Pump Centrifugal P2-011	Service	**2 Weekly** Service of McLanahan Slurry Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Grease gun with either Shell Alvania 3, Mobile EP2, Caltex LS3 or their equivalents. 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Lubricate Bearings while pump is running for best distribution. (Do not over grease as this will cause premature bearing failure) 3 - Inspect gland seal and check flush water is clean and the flow is sufficient (If applicable) 4 - Isolate Pump and check belt tension, 16mm belt deflection over 1 meter is ideal and check pulley alignment. 5 - Inspect all hold down bolts are secure and report any leaks or corrosion.
Clarifier - 102 - Pump Centrifugal P2-011	Service	**2 Weekly** Service of McLanahan Slurry Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Grease gun with either Shell Alvania 3, Mobile EP2, Caltex LS3 or their equivalents. 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Lubricate Bearings while pump is running for best distribution. (Do not over grease as this will cause premature bearing failure) 3 - Inspect gland seal and check flush water is clean and the flow is sufficient (If applicable) 4 - Isolate Pump and check belt tension, 16mm belt deflection over 1 meter is ideal and check pulley alignment. 5 - Inspect all hold down bolts are secure and report any leaks or corrosion.
Clarifier - 101 - Separator Cyclone CY100	Inspect, Clean & Verify	**1 Yearly** Inspection of VWS Hydrocyclone (Multiple asset)	1 - Notify Duty operator and shut down Actiflo and Isolate 2 - Dismantle Hydrocyclone and inspect the inside surface for excessive wear. If components require replacement then raise a Corrective W/O. 3 - Clean the unit and repair any excessive corrosion. 4 - Re assemble unit, de isolate and monitor for leaks.
Clarifier - 101 - Separator Cyclone CY101	Inspect, Clean & Verify	**1 Yearly** Inspection of VWS Hydrocyclone (Multiple asset)	1 - Notify Duty operator and shut down Actiflo and Isolate 2 - Dismantle Hydrocyclone and inspect the inside surface for excessive wear. If components require replacement then raise a Corrective W/O. 3 - Clean the unit and repair any excessive corrosion. 4 - Re assemble unit, de isolate and monitor for leaks.
Clarifier - 102 - Separator Cyclone CY100	Inspect, Clean & Verify	**1 Yearly** Inspection of VWS Hydrocyclone (Multiple asset)	1 - Notify Duty operator and shut down Actiflo and Isolate 2 - Dismantle Hydrocyclone and inspect the inside surface for excessive wear. If components require replacement then raise a Corrective W/O. 3 - Clean the unit and repair any excessive corrosion. 4 - Re assemble unit, de isolate and monitor for leaks.
Clarifier - 102 - Separator Cyclone CY101	Inspect, Clean & Verify	**1 Yearly** Inspection of VWS Hydrocyclone (Multiple asset)	1 - Notify Duty operator and shut down Actiflo and Isolate 2 - Dismantle Hydrocyclone and inspect the inside surface for excessive wear. If components require replacement then raise a Corrective W/O. 3 - Clean the unit and repair any excessive corrosion. 4 - Re assemble unit, de isolate and monitor for leaks.
Clarifier - 101 - Mixer Paddle M2-011	Service	**2 Yearly** or 10,000 Hour Service of SEW Mixer/Scraper (Multiple asset)	(The following items must be on hand to complete this procedure) If Mineral oil then Shell Omala 220 / If Food Grade oil then ISO FM 220 1 - Notify Duty Operator and Isolate individual mixer. 2 - Replace oil in Gearbox as per O&M recommendations. 3 - De Isolate and inspect start up to ensure there is no frothing or over heating.
Clarifier - 101 - Mixer Paddle M2-012	Service	**2 Yearly** or 10,000 Hour Service of SEW Mixer/Scraper (Multiple asset)	(The following items must be on hand to complete this procedure) If Mineral oil then Shell Omala 220 / If Food Grade oil then ISO FM 220 1 - Notify Duty Operator and Isolate individual mixer. 2 - Replace oil in Gearbox as per O&M recommendations. 3 - De Isolate and inspect start up to ensure there is no frothing or over heating.

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Equipment	Task	Frequency	Procedure
Clarifier - 101 - Mixer Paddle M2-013	Service	**2 Yearly** or 10,000 Hour Service of SEW Mixer/Scraper (Multiple asset)	(The following items must be on hand to complete this procedure) If Mineral oil then Shell Omala 220 / If Food Grade oil then ISO FM 220 1 - Notify Duty Operator and Isolate individual mixer. 2 - Replace oil in Gearbox as per O&M recommendations. 3 - De Isolate and inspect start up to ensure there is no frothing or over heating.
Clarifier - 102 - Mixer Paddle M2-011	Service	**2 Yearly** or 10,000 Hour Service of SEW Mixer/Scraper (Multiple asset)	(The following items must be on hand to complete this procedure) If Mineral oil then Shell Omala 220 / If Food Grade oil then ISO FM 220 1 - Notify Duty Operator and Isolate individual mixer. 2 - Replace oil in Gearbox as per O&M recommendations. 3 - De Isolate and inspect start up to ensure there is no frothing or over heating.
Clarifier - 102 - Mixer Paddle M2-012	Service	**2 Yearly** or 10,000 Hour Service of SEW Mixer/Scraper (Multiple asset)	(The following items must be on hand to complete this procedure) If Mineral oil then Shell Omala 220 / If Food Grade oil then ISO FM 220 1 - Notify Duty Operator and Isolate individual mixer. 2 - Replace oil in Gearbox as per O&M recommendations. 3 - De Isolate and inspect start up to ensure there is no frothing or over heating.
Clarifier - 102 - Mixer Paddle M2-013	Service	**2 Yearly** or 10,000 Hour Service of SEW Mixer/Scraper (Multiple asset)	(The following items must be on hand to complete this procedure) If Mineral oil then Shell Omala 220 / If Food Grade oil then ISO FM 220 1 - Notify Duty Operator and Isolate individual mixer. 2 - Replace oil in Gearbox as per O&M recommendations. 3 - De Isolate and inspect start up to ensure there is no frothing or over heating.
Chemical Systems-101 - Polymer / Dosing Pump P9-521	Service	**Every 6 Months** Service of Pulsatron MP Series Chemical Dosing Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Wet end kit Including Diaphragm and Cartridge valves 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Inspect pump and surrounding pipe work for any leaks or corrosion. 3 - Notify Duty operator and then Isolate Pump and replace Cartridge valves and diaphragm as per O&M manual. 4 - Re assemble and de isolate. 5 - Clean down pump and surrounding areas with a clean rag and water.
Chemical Systems-101 - Polymer / Dosing Pump P9-522	Service	**Every 6 Months** Service of Pulsatron MP Series Chemical Dosing Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Wet end kit Including Diaphragm and Cartridge valves 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Inspect pump and surrounding pipe work for any leaks or corrosion. 3 - Notify Duty operator and then Isolate Pump and replace Cartridge valves and diaphragm as per O&M manual. 4 - Re assemble and de isolate. 5 - Clean down pump and surrounding areas with a clean rag and water.
Chemical Systems - 101 - Coagulant / Dosing Pump P9-511	Service	**Every 6 Months** Service of Pulsatron MP Series Chemical Dosing Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Wet end kit Including Diaphragm and Cartridge valves 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Inspect pump and surrounding pipe work for any leaks or corrosion. 3 - Notify Duty operator and then Isolate Pump and replace Cartridge valves and diaphragm as per O&M manual. 4 - Re assemble and de isolate. 5 - Clean down pump and surrounding areas with a clean rag and water.
Chemical Systems - 101 - Coagulant / Dosing Pump P9-512	Service	**Every 6 Months** Service of Sandpiper Chemical Dosing Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Wet end kit Including Diaphragm and Cartridge valves 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Inspect pump and surrounding pipe work for any leaks or corrosion. 3 - Notify Duty operator and then Isolate Pump and replace Cartridge valves and diaphragm as per O&M manual. 4 - Re assemble and de isolate. 5 - Clean down pump and surrounding areas with a clean rag and water.
Chemical Systems - 102 - Polymer / Dosing Pump P9-521	Service	**Every 6 Months** Service of Sandpiper Chemical Dosing Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Wet end kit Including Diaphragm and Cartridge valves 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Inspect pump and surrounding pipe work for any leaks or corrosion. 3 - Notify Duty operator and then Isolate Pump and replace Cartridge valves and diaphragm as per O&M manual. 4 - Re assemble and de isolate. 5 - Clean down pump and surrounding areas with a clean rag and water.
Chemical Systems - 102 - Polymer / Dosing Pump P9-522	Service	**Every 6 Months** Service of Sandpiper Chemical Dosing Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Wet end kit Including Diaphragm and Cartridge valves 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Inspect pump and surrounding pipe work for any leaks or corrosion. 3 - Notify Duty operator and then Isolate Pump and replace Cartridge valves and diaphragm as per O&M manual. 4 - Re assemble and de isolate. 5 - Clean down pump and surrounding areas with a clean rag and water.
Chemical Systems - 102 - Coagulant / Dosing Pump P9-511	Service	**Every 6 Months** Service of Pulsatron MP Series Chemical Dosing Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Wet end kit Including Diaphragm and Cartridge valves 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Inspect pump and surrounding pipe work for any leaks or corrosion. 3 - Notify Duty operator and then Isolate Pump and replace Cartridge valves and diaphragm as per O&M manual. 4 - Re assemble and de isolate. 5 - Clean down pump and surrounding areas with a clean rag and water.
Chemical Systems - 102 - Coagulant / Dosing Pump P9-512	Service	**Every 6 Months** Service of Pulsatron MP Series Chemical Dosing Pump (Multiple asset)	(The following items must be on hand to complete this procedure) Wet end kit Including Diaphragm and Cartridge valves 1 - Inspect Pump for abnormal noise, vibration or heat. 2 - Inspect pump and surrounding pipe work for any leaks or corrosion. 3 - Notify Duty operator and then Isolate Pump and replace Cartridge valves and diaphragm as per O&M manual. 4 - Re assemble and de isolate. 5 - Clean down pump and surrounding areas with a clean rag and water.